

WHAT IS CLAIMED IS:

1 1. A method for operating a storage system configured to provide a Write
2 Once and Read Many (WORM) function, the method comprising:
3 receiving a first command at a storage subsystem from a host; and
4 storing at least a portion of the first command on a WORM storage device
5 coupled to the storage subsystem,
6 wherein the WORM storage device is used to verify the WORM function of
7 the storage system.

1 2. The method of claim 1, further comprising:
2 receiving a second command at the storage subsystem;
3 examining the second command using a command filter, the filter being
4 provided with a predetermined rule for filtering selected types of commands; and
5 storing at least a portion of the second command if the second command
6 satisfies the predetermined rule.

1 3. The method of claim 2, wherein the command filter is configured to
2 filter any command that affects data stored in a storage area of the storage subsystem,
3 wherein the second command is not stored in the WORM storage device.

1 4. The method of claim 3, wherein the command filter is configured to
2 filter at least commands relating to ERASE, FORMAT, and WRITE operations.

1 5. The method of claim 3, wherein the command is a Command
2 Descriptor Block.

1 6. The method of claim 2, wherein the storage subsystem and the storage
2 system are the same, the method further comprising:
3 writing a subsystem configuration file in the WORM storage device whenever
4 a subsystem configuration setting is changed.

1 7. The method of claim 2, wherein the storage subsystem is a disk array
2 unit having a storage area that is defined as a WORM storage area, wherein the subsystem
3 configuration file is used to verify that data on a given storage device have not been changed
4 or to identify a physical address of a logical volume during auditing.

1 8. The method of claim 2, wherein the command filter is configured to
2 filter commands directed to a predetermined storage area in the storage subsystem, the
3 predetermined storage area being defined as a WORM storage area.

1 9. The method of claim 1, wherein at least portions of all commands are
2 stored in the WORM device.

1 10. The method of claim 1, further comprising:
2 associating a serial number to the first command; and
3 storing the serial number in the WORM storage device.

1 11. The method of claim 10, further comprising:
2 associating a timestamp to the first command; and
3 storing the timestamp in the WORM storage device.

1 12. The method of claim 10, wherein the WORM storage device includes a
2 plurality of records representing a plurality of commands received by the storage subsystem,
3 each of the commands being associated with a serial number, the serial numbers being used
4 to sort the commands according to a given order prior to performing an audit of the storage
5 subsystem.

1 13. A method for providing a data archival function, comprising:
2 storing at least portions of commands directed to a storage subsystem in a
3 Write Once and Read Many (WORM) storage device, the commands being of a type that
4 affects a content of data stored in a storage area of the storage subsystem; and
5 associating a serial number to each of the commands, the serial number being
6 useful for sorting the commands in a given order,
7 wherein the WORM storage device includes a plurality of command records,
8 the command records including the at least portions of the commands and the serial numbers,
9 wherein the command records are useful for verifying whether or not a storage
10 subsystem has maintain a WORM integrity.

1 14. The method of claim 13, wherein the WORM storage device is coupled
2 to a host computer, the method further comprising:
3 decoupling the WORM device from the host computer to perform an audit to
4 verify the WORM integrity of the storage subsystem,

5 wherein the plurality of command records are sorted prior to performing the
6 audit using the serial numbers.

1 15. The method of claim 13, wherein the commands directed to the storage
2 subsystems are filtered according to a predetermined rule.

1 16. The method of claim 15, wherein the commands are filtered by
2 examining operation codes associated with the commands or Logical Unit Numbers
3 associated with the commands.

1 17. A method for auditing a storage system, comprising:
2 sorting a plurality of records stored in a Write Once and Read Many (WORM)
3 storage device using serial numbers associated with the records, each record including
4 information on a command sent to a storage subsystem;
5 examining the information on the command for one of the records to retrieve
6 address of a storage area to which the command was directed;
7 obtaining an entry associated with the storage area from a bitmap of a plurality
8 of storage areas of the storage subsystem; and
9 determining whether or not there is an indication of a WORM violation using
10 the obtained entry.

1 18. The method of claim 17, further comprising:
2 reporting a result of the determining step to an auditor; and
3 updating the entry of the bitmap,
4 wherein the information on the command is the command.

1 19. The method of claim 17, wherein the WORM storage device is
2 received from a host computer or the storage subsystem.

1 20. An archival system, comprising:
2 a controller to handle data requests from a host computer, each data request
3 including a command;
4 a command filter to select commands that satisfy a predetermined filtering
5 rule;
6 a Write Once and Read Many (WORM) storage device to store at least
7 portions of the commands that have been selected by the command filter; and

8 at least one storage area that has been defined as a WORM storage area for
9 archiving data.

1 21. The archival system of claim 20, wherein the archival system includes
2 a storage subsystem and a host.

1 22. The archival system of claim 21, wherein the WORM device is
2 coupled to the storage subsystem.

1 23. The archival system of claim 20, wherein the archival system is a
2 storage subsystem.

1 24. The archival system of claim 20, further comprising:
2 a terminal system including a WORM device reader to read information stored
3 in the WORM device and a command checker to examine the information read from the
4 WORM device.

1 25. A computer readable medium comprising a computer program for
2 verifying an archival function, the computer program comprising:
3 code for receiving a first command at a storage subsystem from a host;
4 code for examining the first command using a predetermined rule;
5 code for storing at least a portion of the first command on a WORM storage
6 device coupled to the storage subsystem upon determining that the first command satisfies
7 the predetermined rule;
8 code for receiving a second command at the storage subsystem from the host;
9 code for examining the second command using the predetermine rule; and
10 not storing any portion of the second command upon determining that the
11 second command does not satisfy the predetermined rule.

1 26. An archival system, comprising:
2 means for handling data requests from a host computer, each data request
3 including a command;
4 means for filtering commands using a predetermine filtering rule to obtain a
5 selected command;
6 means for storing the selected command to a Write Once and Read Many
7 (WORM) storage device; and

8 means for associating a serial number to the selected command that is stored
9 in the WORM storage device.

1 27. A disk storage system, comprising:
2 a controller to handle data requests from a host computer, each data request
3 including a command;
4 a command filter to select commands that satisfy a predetermined filtering
5 rule; and
6 a Write Once and Read Many (WORM) device writer operable to store at least
7 a portion of the commands that have been selected by the command filter to a WORM
8 storage device.

1 28. The system of claim 27, wherein the commands are used to verify a
2 WORM integrity of the WORM storage device.

1 29. The system of claim 27, wherein the commands are used to identify a
2 physical address of a logical volume.

1 30. The system of claim 27, wherein a physical address associated with a
2 logical volume is identified by using a configuration table.

1 31. The system of claim 27, wherein subsystem configuration commands
2 saved in the WORM storage device are examined to validate a WORM integrity of the
3 system.